DOES OPENNESS IMPLY GREATER EXPOSURE?
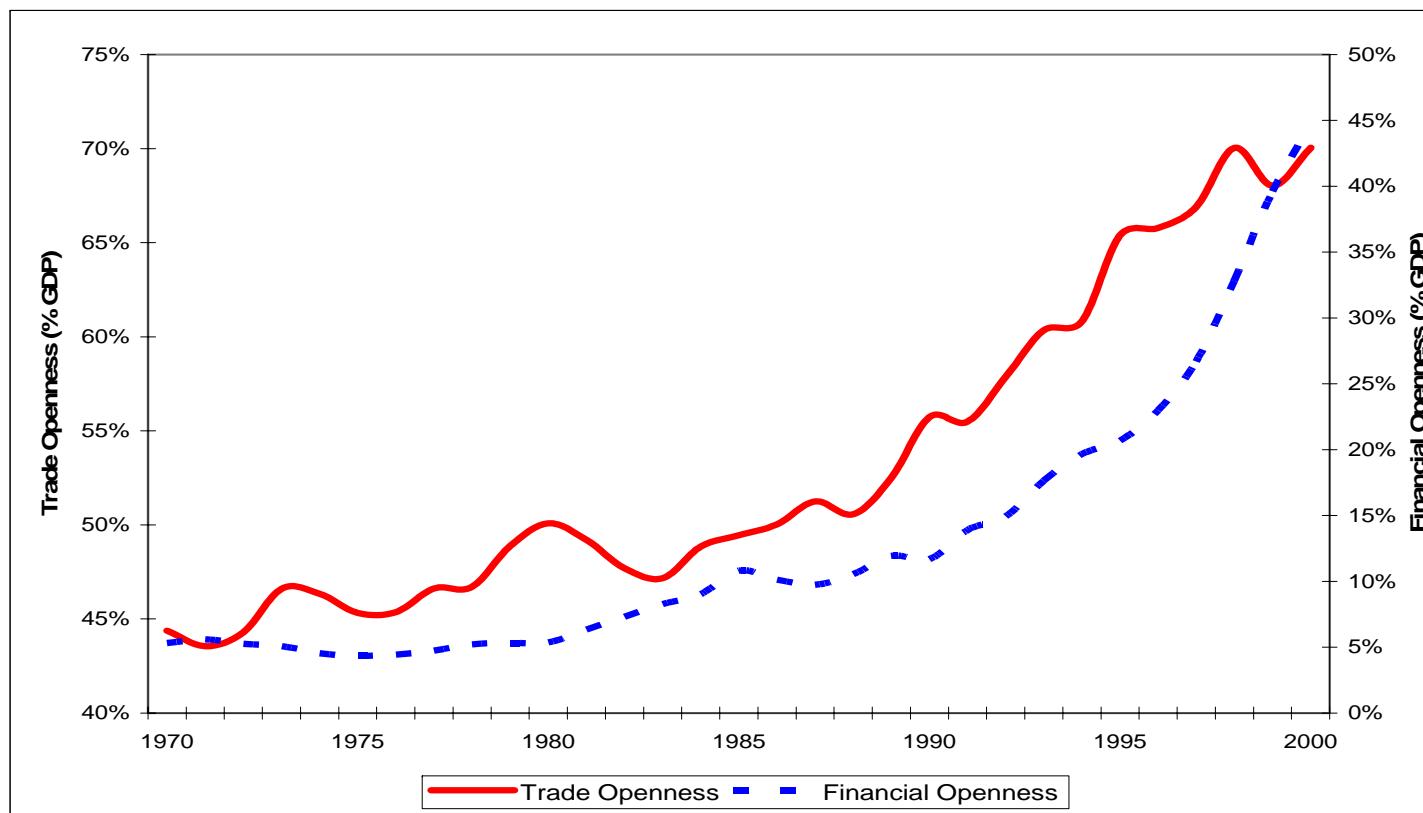
(with César Calderón, World Bank, and Norman Loayza, World Bank)

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CERGE-EI
Prague, 21 February 2006

World trend of rising TO and FO

Figure 1
Trends in Openness, 1970-2000

Note: Openness measures are defined as the ratio of real exports and imports to GDP (trade) and equity-based foreign liabilities fo GDP (financial). World medians are calculated from data for 76 countries.

Paper motivation

- World trend toward larger trade openness (TO) and financial openness (FO) leads to more integration of world goods and capital markets

- Potential gains in growth and welfare

- Literature shows non-monotonic relationship between openness and growth – yet results are neither conclusive nor systematic

- And: there is little research on external exposure

- This paper measures external exposure as sensitivity of first and second moments of growth to openness and foreign shocks

- Extends literature by estimating effects of openness, foreign shocks, and their interaction on GDP growth and growth volatility in the world.

Outline

I. Previous Literature and Open Questions

II. Empirical Analysis

III. Conclusions

I. Previous Literature and Open Questions

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Growing empirical literature on relationships between trade openness, financial openness, foreign shocks, and growth volatility, based on cross-country and panel data.

Main results:

(1) Relationship between FO or TO and growth is neither linear nor monotonic: at low (medium, high) levels of development, openness reduces (raises) growth

(2) Favorable foreign shocks (mostly on ToT, some on capital inflows and trade partners growth) tend to raise growth

(3) Negative effect of growth volatility on growth levels in LDCs is due to interaction of volatility with weak institutions.

I. Previous Literature and Open Questions

(4) Relationship between FO or TO and growth volatility is not robust across different specifications and samples

(5) Foreign shock volatility (ToT, world interest rate, capital flows) tends to raise growth volatility

(6) No studies on effects of FO or TO interactions with foreign shocks (volatility) on growth (volatility)

Most results are not robust across different studies.

Existing studies are not systematic – they do not identify symmetrically the effects of TO and FO, of four classes of external shocks, their interactions, and their effects on both growth levels and growth volatility.

I. Previous Literature and Open Questions

Open Questions:

- (1) How do both TO and FO affect economic growth and growth volatility?

- (2) How do the effects of TO and FO depend on per capita GDP?

- (3) How do foreign shocks (financial and real shocks; price shocks and exogenous determinants of quantity shocks) affect economic growth and growth volatility?

- (4) How do interaction effects between openness measures (TO and FO) and foreign shocks affect growth and growth volatility?

Our paper addresses these questions.

II. Empirical Analysis

II. Empirical Analysis - Outline

- *We conduct two symmetrical empirical analyses for:*
  - Growth (average per capita GDP growth in 5-year periods)
  - Growth volatility (standard deviation of per capita GDP growth in 5-year periods).

- *For each of them, we measure:*
  - simple (linear) effects of openness and external shocks
  - dependence of the effect of openness on per capita GDP
  - amplification of effects of external shocks depending on openness

$\rightarrow$ *5 tables, 18 regressions.*

Sample and methodology

- Pooled data set:
  - 76 countries
  - 5-year periods, 1970-2000

- GMM estimator for panel data:
  - dynamic specifications
  - unobserved country- and time-specific effects
  - joint endogeneity.

Measures of openness

- Outcome measures of openness:
  - Trade: volume of trade / GDP
  - Financial: portfolio and FDI liabilities / GDP

- Note: reported results tend to be robust to using policy measures of openness – the Sachs-Warner binary indicator of trade liberalization and the IMF binary indicator of capital liberalization – as shown in non-reported / previous results.

Measures of external shocks

- (Exogenous) Shocks:
    - Trade:
        - Terms of trade growth
        - GDP growth of trade partners
    - Financial:
        - Regional capital inflows (to ensure exogeneity)
        - Change in international interest rate

Growth regressions: average shock

Volatility regressions: standard deviation of shock.

1. Linear effects

- Regression equation:

$$y_{i,t} = \beta_0'CV_{i,t} + \beta_1'OPE_{i,t} + \beta_2'EXT_{i,t} + \mu_t + \eta_i + \varepsilon_{i,t}$$

- y: either GDP growth or growth volatility
- Standard robust control variables in panel-data growth studies (*CV*): initial per capita GDP, education, financial depth, lack of price stability, government burden
- *OPE:* vector of FO and TO
- *EXT*: vector of ToT, trade partners' growth, capital inflows (world interest rate).

1. Linear effects

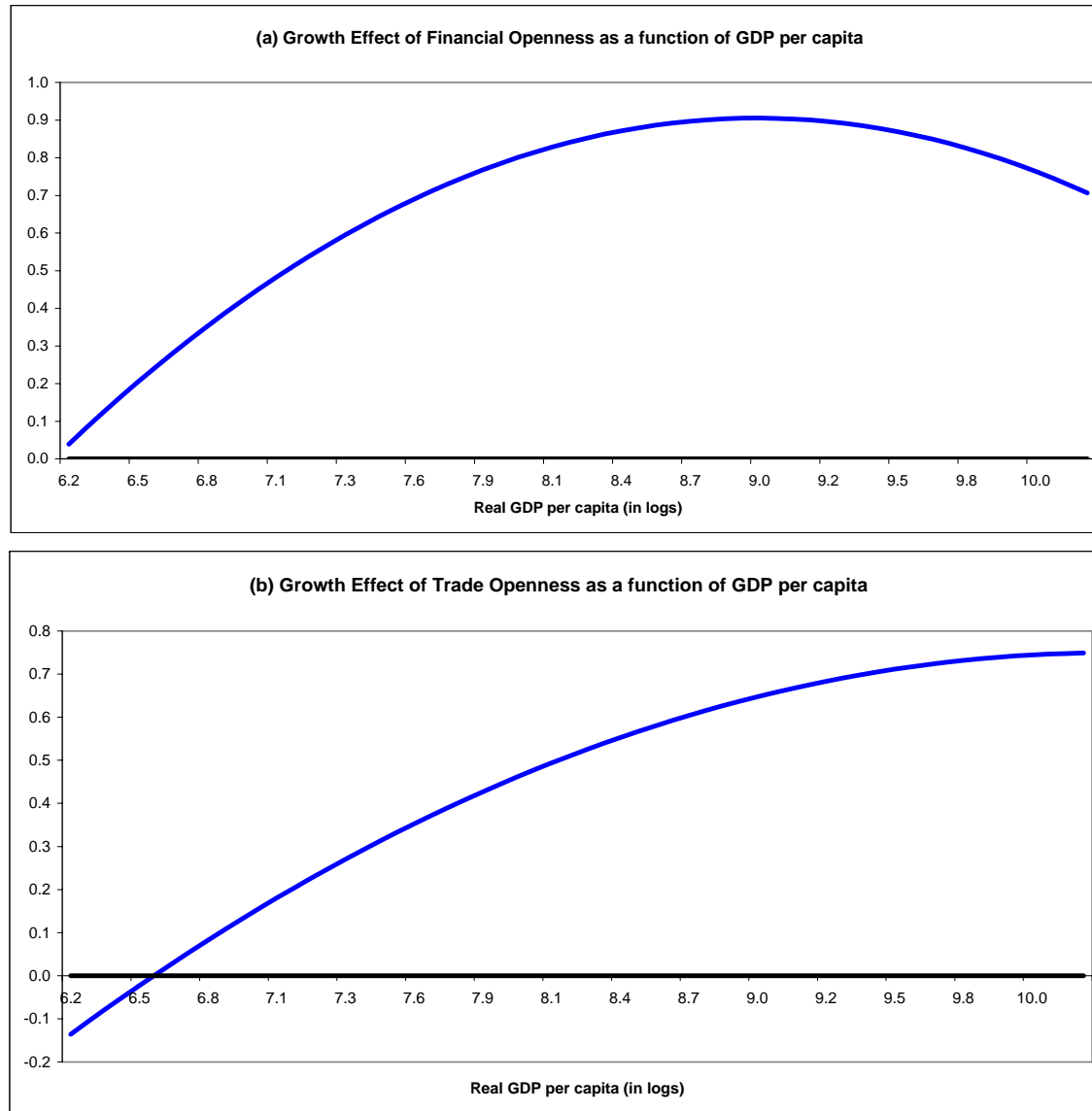|			**Growth**	**Volatility**
Openness	Trade		+	+
	Financial		+	-
Shocks	Trade	ToT	+	+
		TP growth	+	+
	Financial	Cap flows	+	+

2. The effect of openness depending on GDP per capita

- Regression equation:

$$y_{i,t} = \beta_0{}'CV_{i,t} + \beta_1{}'OPE_{i,t} + \beta_2{}'EXT_{i,t} + \beta_3{}'OPE_{i,t}*Inc_{i,t} + \beta_4{}'OPE_{i,t}*Inc_{i,t}^2 + \mu_t + \eta_i + \varepsilon_{i,t}$$
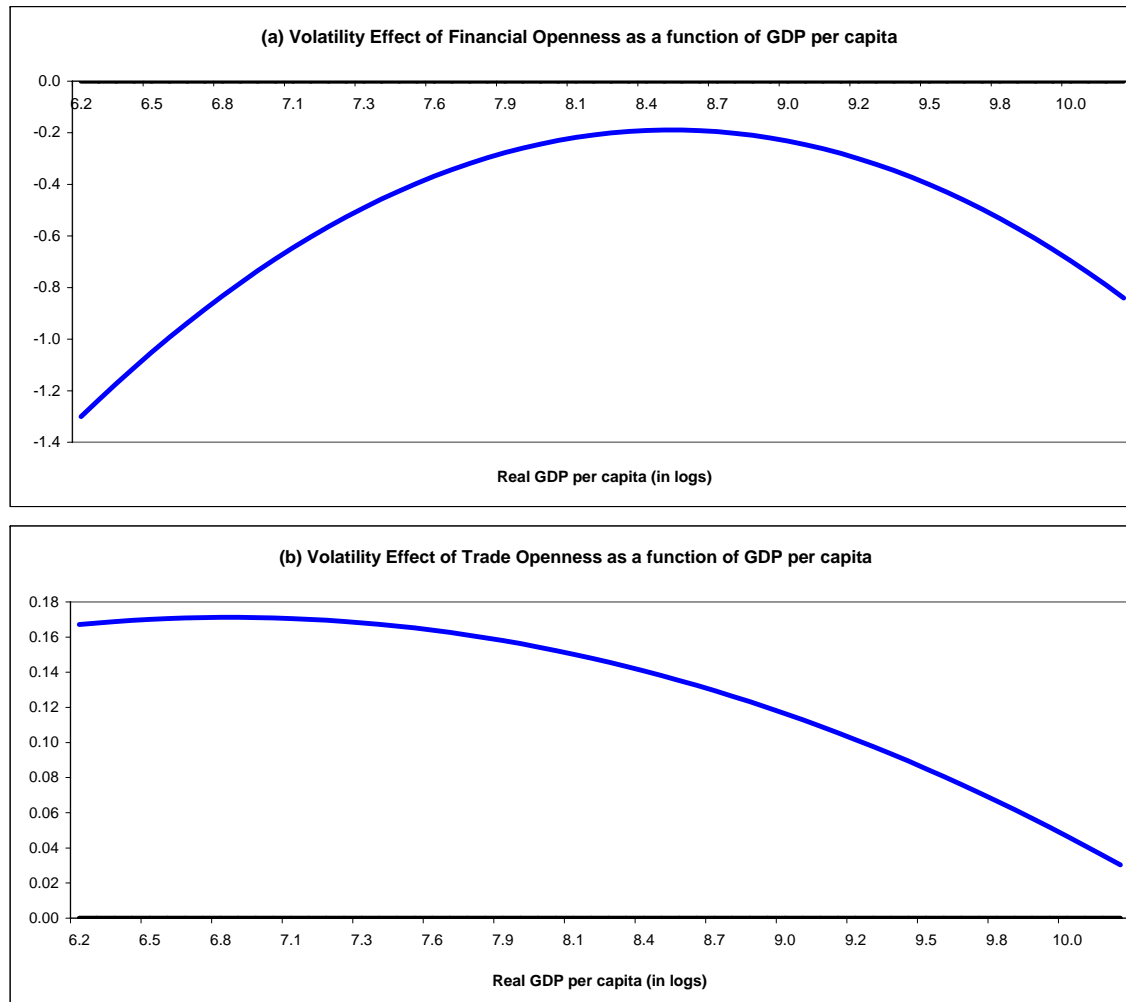
- *Inc* is per capita GDP income (linear and quadratic terms)

Figure 2
Growth Effect of Openness as a function to GDP per capita 1/

(a) Growth Effect of Financial Openness as a function of GDP per capita

Real GDP per capita (in logs)

(b) Growth Effect of Trade Openness as a function of GDP per capita

Real GDP per capita (in logs)

1/ Growth effect of a one standard deviation increase in financial and trade openness. See Table A.3 for the computed standard deviations.

Figure 4
Volatility Effect of Openness as a function to GDP per capita 1/

(a) Volatility Effect of Financial Openness as a function of GDP per capita

Real GDP per capita (in logs)

(b) Volatility Effect of Trade Openness as a function of GDP per capita

Real GDP per capita (in logs)

1/ Volatility effect of a one standard deviation increase in financial and trade openness. See Table A.4 for the computed standard deviations.

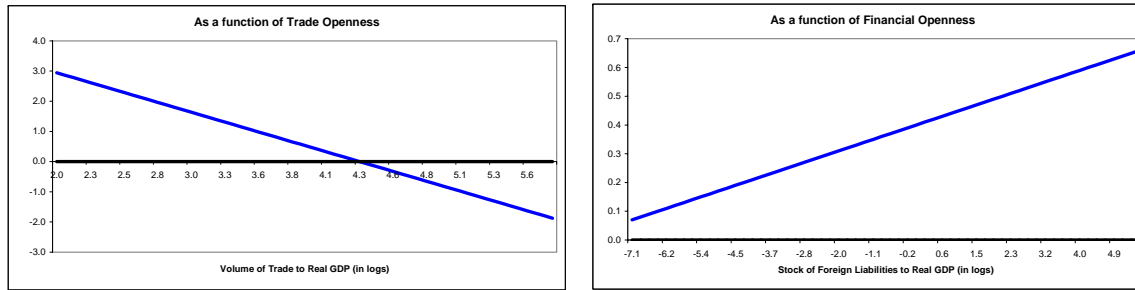# 3. The effect of external shocks depending on openness
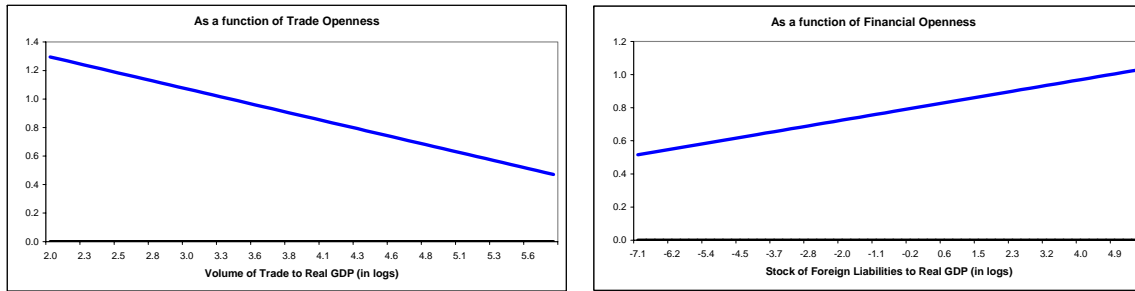
- Regression equation:

$$y_{i,t} = \beta_0{'}CV_{i,t} + \beta_1{'}OPE_{i,t} + \beta_2{'}EXT_{i,t} + \beta_3{'}OPE_{i,t} * EXT_{i,t} + \mu_t + \eta_i + \varepsilon_{i,t}$$

Figure 3
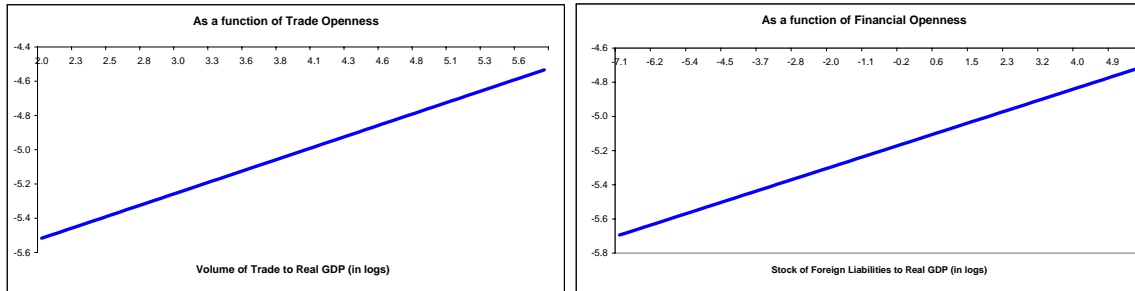**Growth Effect of External Shocks as a Function of Openness 1/**

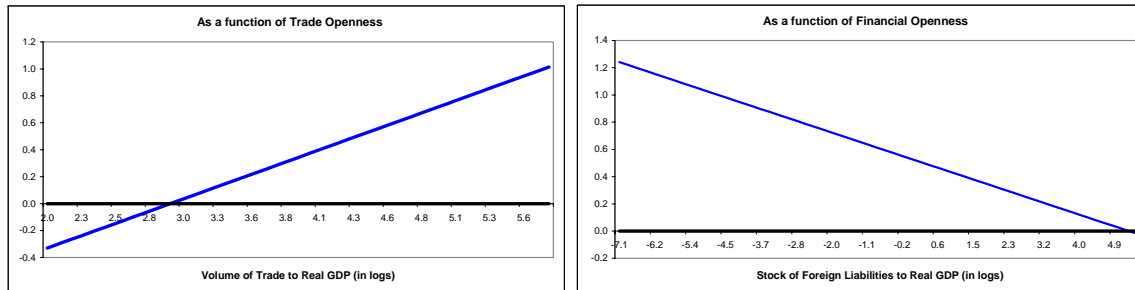**(a) Growth Effect of Terms of Trade Changes**

As a function of Trade Openness

Volume of Trade to Real GDP (in logs)

As a function of Financial Openness

Stock of Foreign Liabilities to Real GDP (in logs)

(b) Growth Effect of Foreign Growth

As a function of Trade Openness

Volume of Trade to Real GDP (in logs)

As a function of Financial Openness

Stock of Foreign Liabilities to Real GDP (in logs)

(c) Growth Effect of World Interest Rate Changes

As a function of Trade Openness

Volume of Trade to Real GDP (in logs)

As a function of Financial Openness

Stock of Foreign Liabilities to Real GDP (in logs)

(d) Growth Effect of Regional Capital Flows

As a function of Trade Openness

Volume of Trade to Real GDP (in logs)

As a function of Financial Openness

Stock of Foreign Liabilities to Real GDP (in logs)
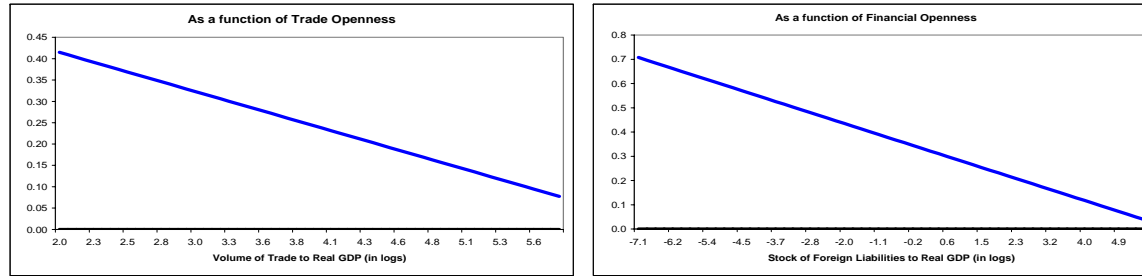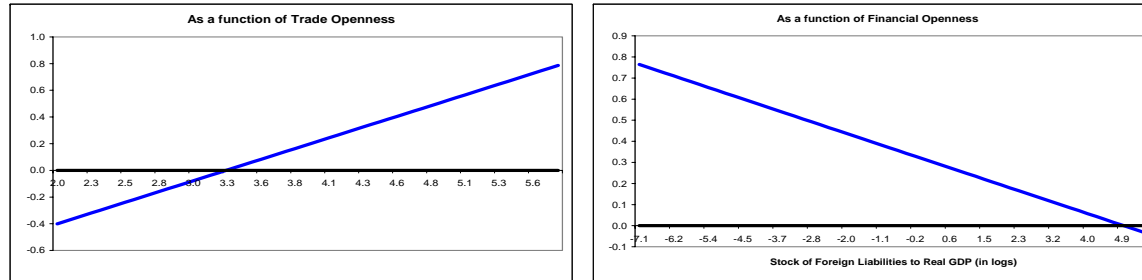
1/ Growth effect of a one standard deviation increase in the corresponding external shock. See Table A.3 for the computed standard deviations of these shocks.

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Figure 5
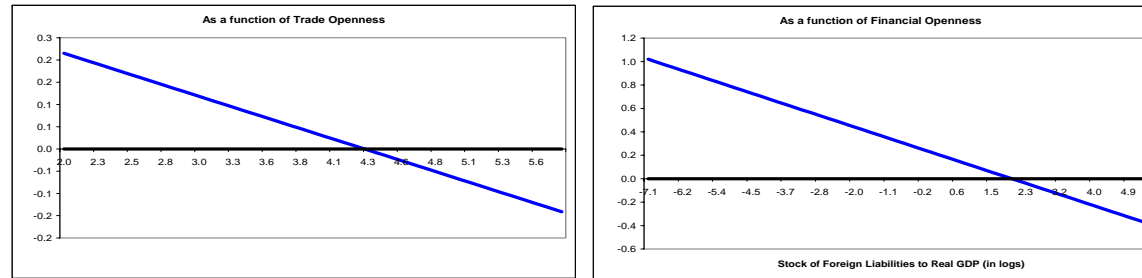**Volatility Effect of External Shocks as a Function of Openness 1/**

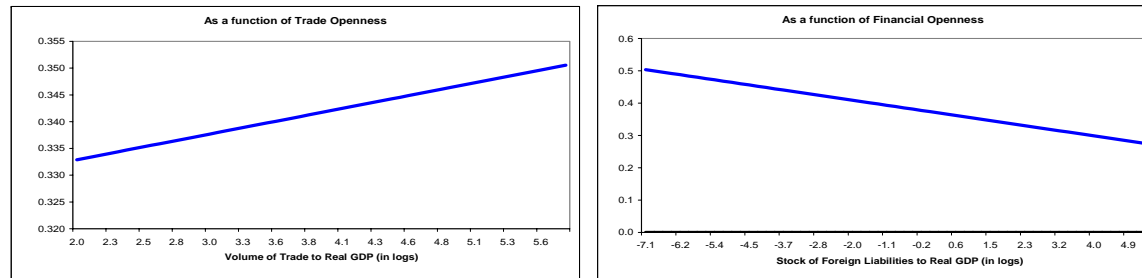**(a) Volatility Effect of Volatility in Terms of Trade Changes**

(b) Volatility Effect of Volatility of Foreign Growth

(c) Volatility Effect of Volatility of World Interest Rate Changes

(d) Volatility Effect of Volatility of Regional Capital Flows

1/ Volatility effect of a one standard deviation increase in the volatility of the external shock. See Table A.4 for the computed standard deviations of these shocks.

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3. The effect of external shocks depending on openness

	Growth		Volatility	
	Trade Op.	Fin. Op.	Trade Op.	Fin. Op.
ToT	↓	↑	↓	↓
TP Growth	↓	↑	↑	↓
Cap flows	↑	↓	...	↓
World rate	↑	↑	...	↓

III. Conclusions

III. Conclusions

1. This paper has presented strong and systematic evidence that TO and FO openness are both good for growth levels; particularly for middle and high-income countries, zero for low-income countries

2. FO reduces significantly growth volatility (less so in middle-income countries) while TO raises somewhat growth volatility (more in low-income countries)

3. Foreign shocks (volatility) have systematic significant effects on growth (volatility); across all shocks, favorable shocks raise growth levels and shock volatilities raise growth volatility.

III. Conclusions

4. TO has an ambiguous role in amplifying or dampening effects of foreign shocks on growth levels and growth volatility; it depends on the shocks

5. However, FO has significant and robust interaction effects with foreign shocks; FO amplifies growth effects of shocks (less capital flows) and dampens volatility effects of all four shock volatilities.

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